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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,688	02/02/2001	Albert D. Edgar		3471

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EXAMINER	
EDWARDS, PATRICK L	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/775,688	EDGAR, ALBERT D.	
	Examiner	Art Unit	
	Patrick L Edwards	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 16-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 16-23* is/are rejected.

7)☒ Claim(s) *1-4,8-11 and 16-23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07-06-2004* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The response received on 11-29-2004 has been placed in the file and was considered by the examiner. An action on the merits follows.

Response to Arguments

2. The applicant's arguments, filed on 11-29-2004 , have been fully considered. A response to these arguments is provided below.

Drawing Objections

Summary of Argument: In the previous office action (the non-final rejection mailed on 01-30-2004), the examiner requested corrected drawings because a) the drawings were illegible; b) they did not include the following reference labels: (410, 420, 430, and 312); and c) they included the following extraneous reference labels: (110, 112, 806). Applicant has submitted replacement drawing sheets.

Examiner's Response: The examiner has received the newly submitted drawings. The examiner agrees that these drawings are now legible, and that the previous problem with the missing reference labels has been obviated by the amendment to the specification.

However, it appears that figure 8 still makes reference to an identifier (806) not mentioned in the written description. A further drawing correction and/or specification amendment is required in order to correct this problem. Futhermore, the replacement drawing sheets have created new problems which will be addressed below.

Specification Objections

Summary of Argument: The previous office action set forth a plurality of objections to the specification based on ambiguities causes by indeterminate language, and general lack of clarity and explanation with respect to some of the key terms of the disclosure.

Examiner's Response: The examiner has received the applicant's amendments to the specification and appreciates applicant's attempts to resolve these problems. However, the examiner submits that there are still several existing problems within the specification that have not been cured by the applicant's amendment. A detailed discussion of these problems is provided in the below rejection

35 USC 112, Second Paragraph Rejections

Summary of Argument: Claims 1-11 and 16-23 were rejected in the previous office action under 35 USC § 112(2) as being indefinite. Applicant has amended the claims in order to overcome these rejections, and argues that the rejections should now be withdrawn.

Examiner's Response: The examiner appreciates the applicant's amendments to both the specification and the claims. However, the examiner submits that there are still 112(2) issues in existence. These issues will be discussed at length in the below rejection.

Prior Art Rejections

Summary of Argument: The applicant traverses the 35 USC § 102 and 103 rejections set forth in the prior office action. Applicant argues that the cited prior art fails to teach the limitations of the amended claims.

Examiner's Response: Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character '502' is used to identify all four of the boxes in the flowchart of Figure 5. As a result of this error, Figure 5 does not correctly correspond with its accompanying description, which makes repeated reference to identifiers '504', '506', and '508'. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. The follow quotations of 37 CFR § 1.75(a) and (d)(1) provide the basis of objection:

> (a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.
>
> (d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

5. Claims 1-4, 9-11, and 16-23 are objected to under 37 CFR § 1.75(a) and (d)(1) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery, and failing to conform to the invention as set forth in the remainder of the specification.

Independent claims 1, 9, 16, and 22 all refer to either "averaging magnitude of a multi-pixel detail," or "guiding magnitude of a multi-pixel detail." Both of these phrases are grammatically awkward and it does not appear as if either one of them are supported in the specification. Specifically, the phrase "magnitude of a multi-pixel detail" is confusing and ambiguous. What is the 'magnitude' referring to? Is this referring to the number of pixels in a local region, or the values of the pixels themselves?

Furthermore, the phrase "multi-pixel detail" is confusing and ambiguous in and of itself. This ambiguity may simply be attributed to awkward wording, but nonetheless, "multi-pixel detail" is not a commonly used term of art. For claim interpretation purposes, this phrase will be interpreted as a local region in an image (i.e. a 'detail' of that image) comprised of more than one pixel.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 5-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claim 5 recites a step of determining a difference between the center square of a window, and all the other squares in the window. The claim then recites weighting a value for each of the other squares in the window (i.e. all the squares in the window except for the center square) based on this difference. The examiner submits that one skilled in the art would not be able to perform this weighting operation in view of the supporting disclosure. In fact, it does not appear as if the disclosure provides any support for the claimed step of weighting a square value based on a previously computed difference determination. The specification does provide support for the aforementioned difference determination step (see applicant's disclosure, paragraph [0035]); but does not provide support for the step of weighting a value of a square based on this difference determination.

In contrast, the disclosure describes multiplying the computed difference values by a weighting factor "k" to produce a "weighted difference value." This is simply not the same operation described by independent claim 5. While the claim recites weighting a value of each square based on the computed difference, the specification describes determining a "weighted difference value" based on a weighting factor k. This operation, unlike the claimed step, does not involve weighting a particular value of a square in a local window. Thus, there is no support

and/or description of this weighting operation in the applicant's specification. The claimed subject matter is therefore not enabled.

Additionally, claim 5 does not comply with the enablement requirement becaue the claimed steps do not result in a blurred image, and therefore do not constitute a "method of blurring" as recited in the claim's preamble.

Starting at the claimed step of "determining a difference..." and proceeding through the remainder of the claim, one can see that the claimed steps will produce an output that consists solely of the summation of all the values of the noisy artifact window (except for the center squre value, which is not summed).

Although the examiner is not exactly clear as to how outputting a summation of all these values would result in a blurred image; the examiner is quite certain that this is the output that the claimed method will produce. Simply stated, the last step of "dividing said results...." will result in a division operation which cancels out the weighted summation of the less noisy artifact. Leaving only the summation of the squares of the noisy artifact window. Therefore, the claimed "method of blurring" does not enable a skilled artisan to achieve a blurred image result.

Furthermore, the examiner submits that the steps described in the disclosure would also fail to produce a blurred image—albeit for different reasons. Amended paragraph [0036] describes the step of limiting a weighted difference determination with a threshold factor (see step 608 of Figure 6: In this step the weighted difference from step 606 is limited by the product of one over a threshold factor). The reference further states that "In every event, the threshold factor is chosen to yield a value ... between one and zero when each weighted difference value is multiplied by one over the threshold factor."

The next paragraph of the reference (paragraph [0037] describes the next step, 610. The reference recites that "In a step 610, a new weighted value of either zero or one is derived for each weighted difference value by setting the new value at 0.0 when the original product of the weighted difference value times one over the threshold factor is greater than one and at 1.0 when the original product of the weighted difference values times one over the threshold is less than one."

The combination of these two steps presents a glaring and unmistakable problem. The new weighted value computed in step 610 will be 1.0 in all instances. The reference explicitly states that the product of the weighted difference and one over a threshold value will yield a value 'between one and zero." The reference then states that a new weighted value will be set to 0.0 when the aforementioned product is greater than one. This situation, of course, will never occur since the computed product will always fall between zero and one. The 'new weighted value' will always be set at 1.0, since a value between zero and one is inherently less than one.

Since all of the weighting factors will be set to 1.0, the examiner submits the intended purpose of the invention (a method for blurring images) will not be accomplished.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 5-8 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
With respect to claim 5, the metes and bounds of this claim are not clear for the reasons discussed at length in the above paragraph.

Claims 6-8 are rejected because they are dependent on an indefinite claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-3, 5-7, 9, 10, 16-17 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ristau et al. ("Digital Filtering of 2-D Spatial Data using Modified Local Statistics").

With regard to claim 1, Ristau discloses a method of blurring (performing noise reduction) on a digital image. Ristau discloses separating the image into noisy and less noisy artifacts (Ristau pg. 2, line 4: The reference discloses variable's z and x, which are analogous to noisy and less noisy artifacts, respectively, as recited in the claim). The applicant defines the term "artifact" as a digital data set in lines 9-10 of the specification. For interpretation purposes, this definition is incorporated herein.

Ristau further discloses averaging magnitude of a multi-pixel detail in the less noisy artifact over a spatial range for each pixel of the image (Ristau pg. 2, lines 8-10); and guiding magnitude of a multi-pixel detail of a noisy artifact by the less noisy artifact in the step of averaging (Ristau pg. 2, line 17: this equation shows the noisy artifact as a function of the less noisy artifact. In other words, the noisy artifact is being determined or "guided" by the less noisy artifact.

Furthermore, Ristau discloses that the multi-pixel detail of a noisy artifact corresponds to the multi-pixel detail of a less noisy artifact (Ristau pg. 2, lines 4-5).

With regard to claim 2, Ristau discloses determining a difference between a pixel at a centrum of the spatial range and another pixel of the spatial range (pg 2 lines 13-16). Ristau discloses determining the variance under a filter mask. Determining a difference between a pixel at the center of a spatial range and another pixel of the spatial range is inherent in the process of calculating the variance of a spatial range corresponding to a center pixel. Ristau further discloses weighting the noisy artifact based on the differences (pg 2 lines 21-23). Ristau discloses a value k which weights the noisy artifact in line 21. This value is determined based on the difference (variance) as shown on line 23.

With regard to claim 3, Ristau discloses performing the steps of determining and weighting for each pixel in the image (pg 2 lines 14-15). Ristau further discloses that the weighting correlates the spatial ranges of the less noisy artifact with the ranges of the noisy artifact (pg 2 line 21 eqn 5). The weighted term in this equation is a difference (or correlation) value between pixels of the noisy and less noisy artifacts.

With regard to claim 5, Ristau discloses deriving a noisy artifact and selecting a less noisy artifact (Ristau pg. 2, lines 4-5: the variables z and x disclosed in the reference are noisy and less noisy artifacts, respectively.

Ristau further discloses subdividing the the noisy artifact into a plurality of windows, and then subdividing each of those windows into a plurality of squares (Ristau pg. 2 lines 6-8: the reference describes computing local statistics (mean and variance) of the noisy artifact, z. The computation of local statistics requires the use of a local area or 'window' recited in the claim. Further, this window is subdivided into a plurality of squares which comprise individual pixels. The process of computing a local mean and/or variance requires these two limitations).

Ristau further dislcoses the above subdividing operation for the less noisy artifact, x (Ristau pg. 2 lines 13-16, in conjunction with the two equations preceding this excerpt: the reference describes that these local statistics are computed for both the noisy and less noisy artifacts).

For claim examination purposes—and in view of the several issues that render the claim indefinite—the remaining steps of the claim will be interpreted simply as a method of averaging the less noisy artifacts over a spatial range for each pixel of the image, and guiding the noisy artifacts by the less noisy artifacts in the step of averaging. This interpretation will be adopted since this is the first embodiment of the invention, and it appears to be a more generalized recitation of the remaining steps.

With regard to these limitations, Ristau further discloses averaging magnitude of a multi-pixel detail in the less noisy artifact over a spatial range for each pixel of the image (Ristau pg. 2, lines 8-10); and guiding magnitude of a multi-pixel detail of a noisy artifact by the less noisy artifact in the step of averaging (Ristau pg. 2, line 17: this equation shows the noisy artifact as a function of the less noisy artifact. In other words, the noisy artifact is being determined or "guided" by the less noisy artifact.

Furthermore, Ristau discloses that the multi-pixel detail of a noisy artifact corresponds to the multi-pixel detail of a less noisy artifact (Ristau pg. 2, lines 4-5).

Referring to claims 6 and 7, Ristau discloses clamping a weighting value between a minimum extremem of 0 and a maximum extreme of 1 (Ristau pg. 2 line 26).

With regard to claim 9, all of the limitations have been addressed with respect to claim 1.

With regard to claim 10, Ristau discloses limiting noise in a low contrast area of an image (pg 2 lines 26-27). An overly expressed property of a noisy artifact is the appearance of the noise in the image. Consequently, limiting the noise of a noisy artifact in a low contrast area of an image prevents the image from appearing noisy and an expression of an overly expressed property of the noisy artifact is suppressed. As a result, the limitations of claim 10 are inherent in Ristau's disclosure.

With regard to claims 16 and 17, all of the limitations of the claim have been addressed with respect to claims 1 and 3, respectively.

With regard to claim 17, all of the limitations of the claim have been addressed with respect to claim 3.

With regard to claim 22, Ristau discloses a system for blurring (reducing noise) comprising a noisy artifact and a less noisy artifact which have corresponding spatial locations (pg 2 lines 4-5). Ristau further discloses guiding the noisy artifact by the less noisy artifact (pg 2 line 17). Although Ristau doesn't explicitly disclose a computer for performing this operation, a computer has to exist in order for this operation to be performed. Therefore, a computer is inherent in the disclosure.

With regard to claim 23, all of the limitations have been addressed with respect to claim 2 above.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ristau as applied to claim 1 above, and further in view of Cok (USPN 5,264,924). The arguments as to the relevance of Ristau as applied in paragraph 8 above are incorporated herein.

Ristau discloses a noisy artifact and performing steps of guiding and weighting based on the noisy artifact. Ristau fails to expressly disclose that the noisy artifact is a representation artifact, which is derived as the average of noisy artifacts.

Cok, however, discloses a representation artifact which is derived as the average of the noisy artifacts (Cok col 2 lines 6-11). The luminance sensor output L, which is derived from the r, g and b signals for which reduced noise estimates are desired, gets guided and then weighted in order to produce a noise-reduced (blurred) estimate of the noisy artifacts (Cok col 2 lines 29-36).

It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the derivatiion of a representation noisy artifact as an average of the noisy artifacts as taught by Cok, with Ristau's method of guiding and weighting a noisy artifact. Such a modification would have allowed for a method that could perform a blurring operation on a plurality of color components with one noisy artifact (Cok col 2 lines 34-36). This would have saved processor time and consequently sped up the blurring process.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ristau as applied to claim 10 above and further in view of Cok (USPN 5,264,924). The arguments as to the relevance of Ristau as applied in paragraph 8 above are incorporated herein.

Ristau discloses limiting an expression of an overly expressed property of a noisy artifact, but fails to expressly disclose that the noisy artifact exhibits a property of the color green.

Cok, however, discloses reducing green measurement noise by 20-30% (Cok col 8 lines 18-20). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Ristau's step of limiting an expression of an overly expressed property of a noisy artifact by specifying the reduction of the property of the color green as taught by Cok. Such a modification would have allowed for the expression limiting step to be applied to a color which benefits greatly from such an operation.

15. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ristau as applied to claim 17 above, and further in view of Gray et al. (USPN 5,641,596). The arguments as to the relevance of Ristau as applied in paragraph 8 above are incorporated herein.

With regard to claim 18, Ristau discloses deriving, guiding and averaging steps with a noisy artifact. Ristau fails to expressly disclose repeating these steps with more than one noisy artifact. Gray, however, discloses performing a smoothing operation on a plurality of noisy artifacts (Gray col 3 lines 9-11).

It would have been obvious to one reasonably skilled in the art at the time of the invention to repeat Ristau's deriving, guiding and averaging steps for a plurality of noisy artifacts as taught by Gray. Such a modification would have allowed for a method that would reduce noise in all of the color channels of an image and would result in better quality image.

With regard to claim 19, Gray further discloses performing a smoothing operation on a plurality of less noisy artifacts (Gray col 2 lines 52-55). The average density and standard deviation values of an image patch as disclosed in Gray is analogous to a less noisy interest as recited in the claim in that these values guide a noisy artifact in the method of blurring.

With regard to claim 20, Gray discloses repeating the claimed steps with more than one noisy filter and more than one less noisy filter.

With regard to claim 21, Gray discloses that the average density and standard deviation values calculated for a given color channel in an image patch (Gray col 2 lines 52-55) correspond to a noisy artifact of the same color channel (Gray col 3 lines 3-22).

Allowable Subject Matter

16. Claim 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st and 2nd paragraphs, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick L Edwards Art Unit 2621

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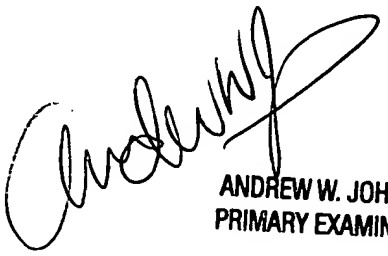

ANDREW W. JOHNS
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